

Project Title

An Event-Driven Process Is More Efficient And Increased The Productivity Of Antimicrobial Stewardship Pharmacists Performing Prospective Audit And Feedback On Antimicrobial Use

Project Lead and Members

Project lead: Choo Sing Meng Robin

Project members: Dr Lin Li, Tan Wei Keat, Cheow Solana

Organisation(s) Involved

Ng Teng Fong General Hospital

Healthcare Family Group Involved in this Project

Pharmacy

Project Period

Start date: Jan-2017

Completed date: Sep-2017

Aims

We aimed to increase the percentage of cases requiring Antibiotic Stewardship (AS) recommendation to 50% and the acceptance rate of recommendations to 70%.

We also aimed to evaluate the types of AS interventions and their acceptance rates to guide future AS practices.

Background

See poster appended / below

Methods

See poster appended / below

Results

See poster appended / below

Lessons Learnt

The event-driven module has efficiently identified higher proportion of cases with inappropriate antibiotic use. This allowed AS pharmacists to review all antibiotic classes and make more recommendations, increasing their productivity.

Conclusion

See poster appended / below

Project Category

Productivity

Project Category

Care & Process Redesign, Value Based Care, Productivity, Time Saving, Quality Improvement, Workflow Redesign, Access To Care, Waiting Time

Keywords

Antimicrobial Stewardship Pharmacists, Event-Driven Module, Clinical Decision Support System, Prospective Audit and Feedback, Inappropriate Antibiotic Use

Name and Email of Project Contact Person(s)

Name: Choo Sing Meng Robin

Email: robin_choo@nuhs.edu.sg

AN EVENT-DRIVEN PROCESS IS MORE EFFICIENT AND INCREASED THE PRODUCTIVITY OF ANTIMICROBIAL STEWARDSHIP PHARMACISTS PERFORMING PROSPECTIVE AUDIT AND FEEDBACK ON ANTIMICROBIAL USE

CHOO SING MENG ROBIN, LIN LI, TAN WEI KEAT, CHEOW SOLANA

- SAFETY
- PRODUCTIVITY
- PATIENT EXPERIENCE
- QUALITY
- VALUE

Define Problem, Set Aim

The Antibiotic Stewardship (AS) team adopted Prospective Audit and Feedback (PAF) as a strategy to steward piperacillin-tazobactam and the carbapenems use in our institution. This led to a high rate of appropriate use of the targeted antibiotics and consequently AS pharmacists had to plough through large number of cases only to identify few opportunities for interventions. Between March to September 2016, 955 cases were reviewed but only 247 (25.9%) cases required AS team's recommendation.

The team redesigned the EPIC AS module to an event-driven module to improve our efficiency and productivity. This module also expanded our audit to include all classes of anti-infective agents. We aimed to increase the percentage of cases requiring AS recommendation to 50% and the acceptance rate of recommendations to 70%. We also aimed to evaluate the types of AS interventions and their acceptance rates to guide future AS practices.

Establish Measures

Baseline data collected from March 2016 – September 2016

Outcome Measures (Baseline)

Percentage of cases with AS recommendations and acceptance rates of AS recommendations

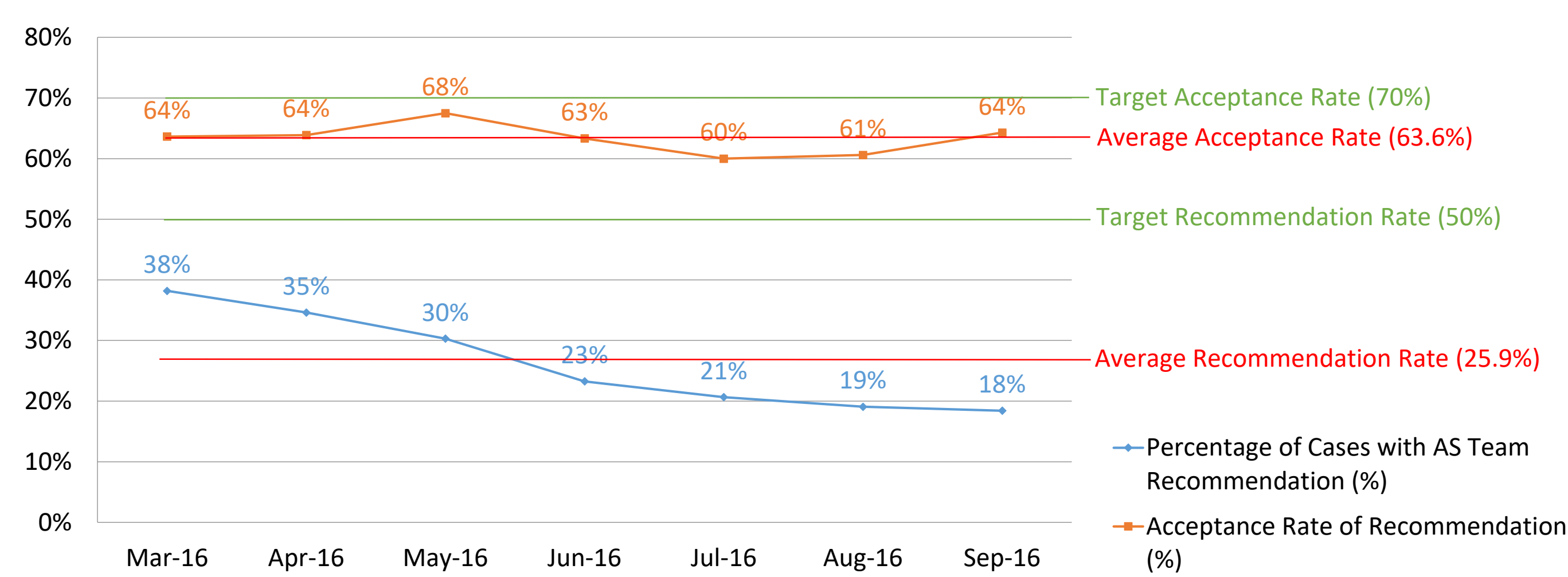


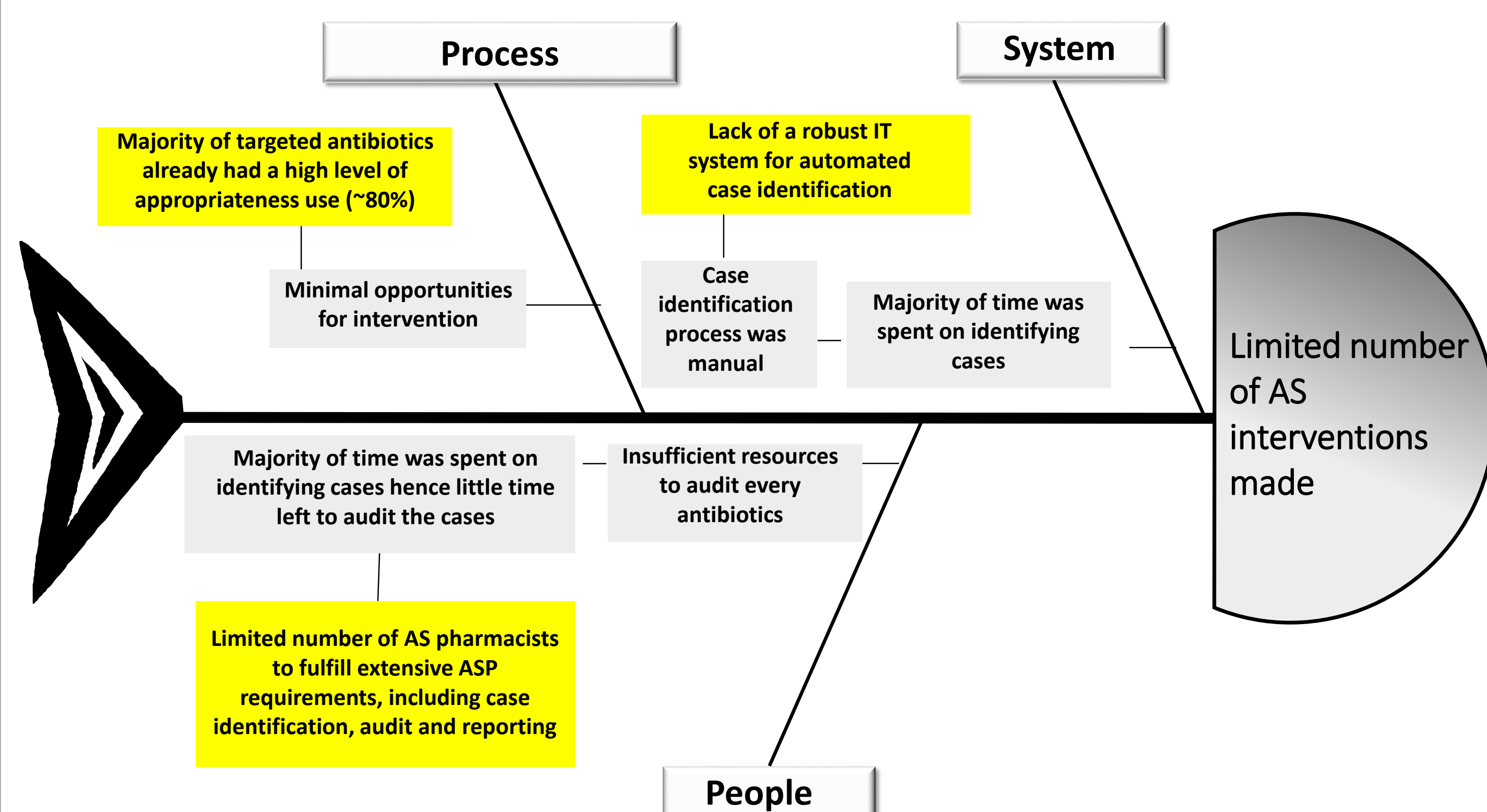
Table 1: Types and Numbers of Recommendations Made

Inappropriateness	Recommendation	n*
Absence of Indication	Discontinue the antibiotic	79
Redundant Coverage	Discontinue other antibiotic(s)	4
Inappropriate Choice	Broadening of empirical coverage	0
	Narrowing of empirical coverage	28
	Escalation based on culture and susceptibility result	5
	De-escalation based on culture and susceptibility result	50
Inappropriate Route	IV to PO switch	4
Inappropriate Dose	Dose/frequency adjustment	11
Inappropriate Duration	Duration suggestion	49
Unable to Determine	Further investigations	9
	ID referral	8
Total intervention		247

*n = number of recommendations made from each category

Analyse Problem

Figure 1. Fishbone Diagram



Select Changes

Issues Identified	Potential Solutions
Majority of carbapenem and piperacillin-tazobactam use is appropriate	Expand the audit to include other classes of antibiotics
Limited number of AS pharmacists	Utilise EPIC to automatically select for cases with potentially inappropriate use for AS pharmacists' review
Lack of a robust clinical decision support system (CDSS) initially.	Install clinical rules and existing institution's policies (e.g. Broad Spectrum Antibiotics policy) into EPIC to enhance the CDSS to identify inappropriate antibiotic use based on events that flout the rules or policies instead of antibiotic targeted audit.

Test & Implement Changes

The Event-Driven module was implemented in January 2017. Data from March 2017 to Sep 2017 (post-implementation) was collected and compared with baseline data.

Outcome Measures (Baseline versus Post-implementation)

Percentage of cases with AS recommendations and acceptance rates of AS recommendations

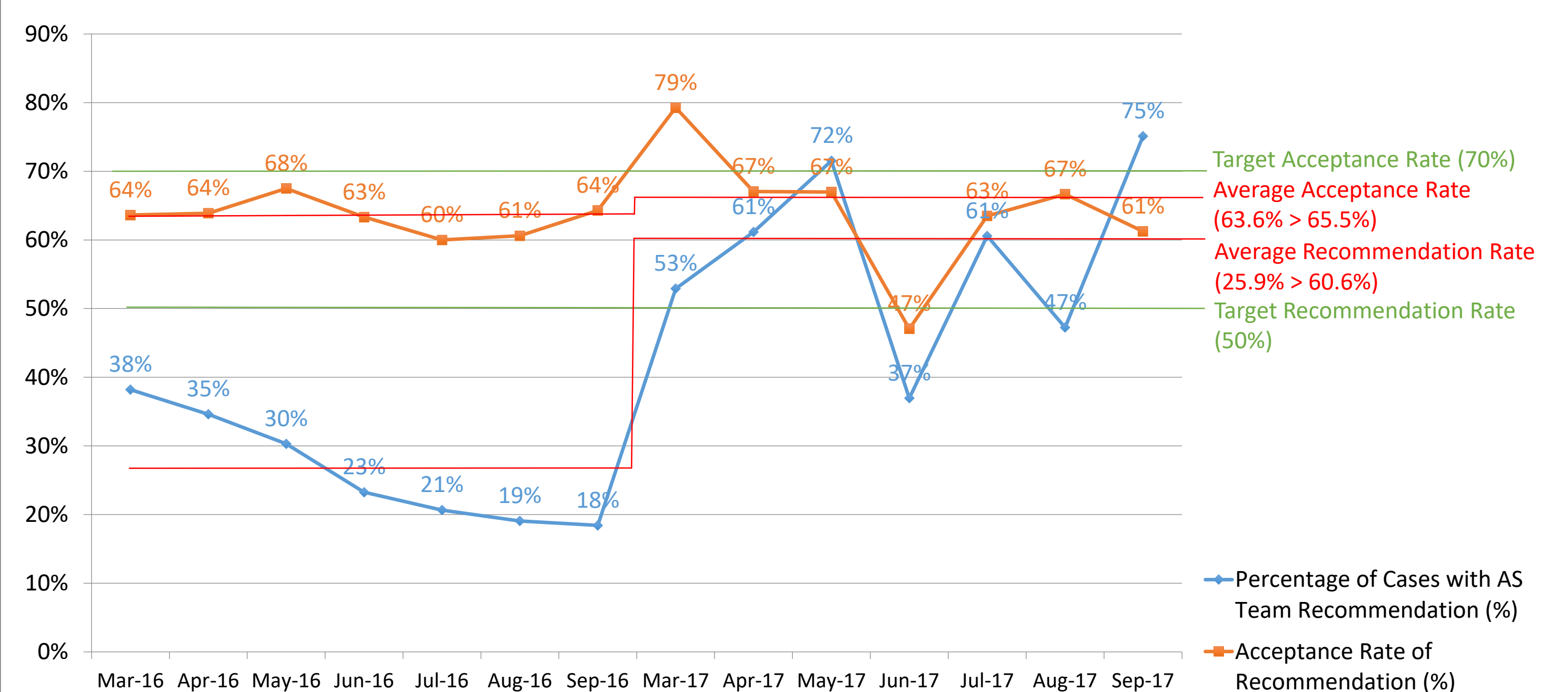


Table 2. Comparison of recommendation types pre- and post- implementation

Inappropriateness	Recommendation	Pre	Post	P-value	Odds Ratio
Absence of Indication	Discontinue the antibiotic	79	147	< 0.001	1.915
Redundant Coverage	Discontinue other antibiotic(s)	4	14	0.023	3.383
Inappropriate Choice	Broadening of empirical coverage	0	0	-	-
	Narrowing of empirical coverage	28	2	< 0.001	0.066
	Escalation based on culture and susceptibility result	5	71	<0.001	14.55
Inappropriate Route	De-escalation based on culture and susceptibility result	50	228	< 0.001	5.359
	IV to PO switch	4	67	<0.001	17.11
Inappropriate Dose	Dose/frequency adjustment	11	18	0.234	1.576
Inappropriate Duration	Duration suggestion	49	38	0.156	0.732
Unable to Determine	Further investigations	9	14	0.346	1.495
	ID referral	8	6	0.536	0.716

Learning Points

The event-driven module has efficiently identified higher proportion of cases with inappropriate antibiotic use. The module also allowed AS pharmacists to review all antibiotics classes.

Given the similar amount of manpower between both periods, a higher number of recommendations was made after implementation of the module thereby increasing the productivity of AS pharmacists.